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## ⑤網目付プラスチックフィルムの製造方法

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## ⑤特許請求の範囲

1 環状をした外金体と、その外金体の内側に稍隙間を設けて備えられた内金体とからなるプラスチックフィルム製造用ダイの前記内金体の端部に溶融プラスチックレジンの流動ガイド体を連接せしめ、その流動ガイド体の周囲を相互に逆方向へ廻動する少なくとも一対の廻動体を配設せしめ、その廻動体の内壁面に突起を設けておき、その突起で押し出されたプラスチックレジンの外面に削溝をつけるか、又はその突起より別異の溶融プラスチックを吹き付けて網目を施すことを特徴とする網目付きプラスチックフィルムの製造方法。

## 発明の詳細な説明

本発明は網目付プラスチックフィルムの製造方法に関する。

従来、この種の技術として外金体と内金体とから構成されたダイ自体を回転させる形式のものが知られている。

しかしながら、ダイ自体を回転させる形式のものは、中を流動する溶融プラスチックレジンが押し出されながら共に回転力を与えられるために抵抗率が高くなってしまい、スムーズに作動せず、又精工な製品が得にくくなり、装置自体もダイの内面に各種の溝や分岐所等の要素を加える必要が

あり複雑となつてしまい、故障や製品価格高騰の因ともなつていたものである。

そこで、本発明はかかる点に着目してなされたもので、ダイ自体は静止した状態に保ちながら安5定した状態で網目を施すことができ、しかも構成が簡単であつて故障が生ずる虞れもなく、スムーズに精工な製品を安価に得ることができるようになした網目付プラスチックフィルムの製造方法を提供するもので、その要旨とするところは環状をした外金体と、その外金体の内側に稍隙間を設けて備えられた内金体とからなるプラスチックフィルム製造用ダイの前記内金体の端部に溶融プラスチックレジンの流動ガイド体を連接せしめ、その流動ガイド体の周囲を相互に逆方向へ廻動する少な10くとも一対の廻動体を配設せしめ、その廻動体の内壁面に突起を設けておき、その突起で押し出されたプラスチックレジンの外面に削溝をつけるか、又はその突起より別異の溶融プラスチックを吹き付けて網目を施すことを特徴とする網目付プラスチックフィルムの製造方法に存する。

次に、本発明の実施の一例を図面について説明する。

図中1は本発明の実施に際し用いられる網目付プラスチックフィルムの製造装置本体である。この製造装置本体1はダイホルダー2に支承されたダイ3を有しており、このダイ3は環状の外金体4と、その外金体4の内側に溶融プラスチックレジンの流通用の隙間5をあけて内金体6が設けられている。

この内金体6の端部には、その内金体6と略同径をした溶融プラスチックレジンの流動ガイド体7が連接されている。

一方、この流動ガイド体7の周辺にはその流動ガイド体7を中心として相互に逆方向へ廻動する35一対の廻動体8, 8aが外部動力により廻動自在に備えられている。

この廻動体8, 8aは流動ガイド体7側に向つ

た内壁面に少なくとも一以上の突起9が突設されている。この突起9の形状は目的に応じ適当なものが選択される。

又、この廻動体8, 8aはダイ2を流動してくる溶融プラスチックレジンとは別異に用意された溶融プラスチックレジンを流通せしめ、突起9の先端より吹き出してやることもできるものとなつてている。

尚、図中10はインフレーション用の貫通孔、11はチューブ状に安定させるための安定体である。

本発明の実施に際し、用いられる製造装置は上述の如く構成されており、外金体4と内金体6により形成された隙間5を通つて流動し、押し出されてくる溶融プラスチックレジンは流動ガイド体7を巡つて沿うようになお流動を続ける。この時に廻動体8, 8aに設けられた突起9を該溶融プラスチックレジンの外周面に当接しつつ、流動ガイド体7を中心として廻動せしめて、表面に削溝を形成してやるようにする。この際、溶融プラスチックレジンは流動ガイド体7に沿つて直進し、廻動体8, 8aは相互に逆方向に廻動するため交叉する網目が施されることとなる。

尚、廻動体8, 8aの突起9より別異の溶融プラスチックレジンを吹き出してやる場合には、その突起9は流動ガイド体8を沿つてくる溶融プラスチックレジンと当接せしめる必要はなく、吹き出し力によつて網目を一体化せしめるようにすればよい。

本発明に係る網目付プラスチックフィルムの製造装置は、上述の如く構成され、又その製造装置の使用方法も上述の如くである。製造装置のダイ自体が回転されず、押し出された後に廻動体によつて網目を施すため、スムーズにしかも精工な製品を得ることができる。

又、ダイの内部に各種要素を加える必要がないので、装置自体が簡略化され、故障を起す虞れもなく、既存の機械に付加して実施することができる、製品価格も安価なものとして需要者に供給することができる。

更に、こうして製造された製品は従来分子配列の関係から避けられなかつた縫裂に対して強靭なものとなり、均一に肉薄のものとなりその強度は変わることがなく、積重ね等しても滑る虞れがないものとなつてゐる。又網目を内側にして袋体を形成すれば密着することなく、口開性が良好となるものである。

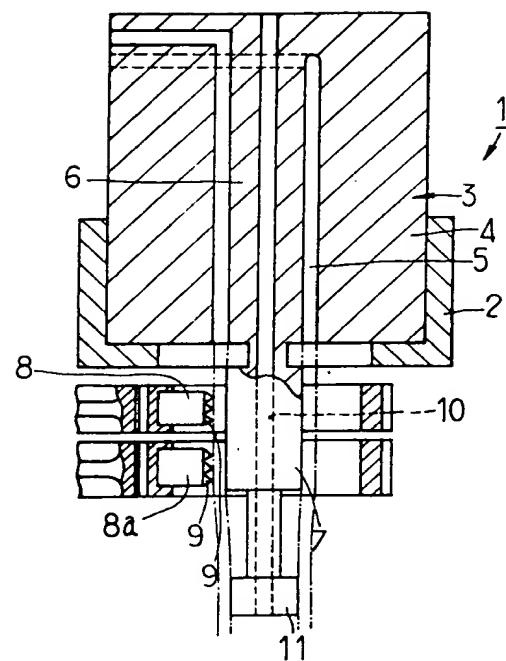
このように、本発明は優れた利点を有しているもので、本発明を実施することはその実益的価値が甚だ大なるものがある。

#### 図面の簡単な説明

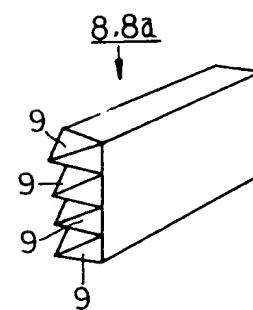
図面は本発明の実施の一例を示すもので、第1図は本発明の実施に際して使用される網目付プラスチックフィルムの製造装置の断面図、第2図は同廻動体の斜視図、第3図は同製造された網目付プラスチックフィルムの部分平面図である。

1……製造装置本体、2……ダイホルダー、3……ダイ、4……外金体、5……隙間、6……内金体、7……流動ガイド体、8, 8a……廻動体、9……突起、10……貫通孔、11……安定体。

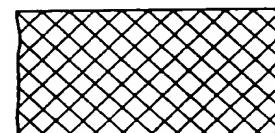
第1図



第2図



第3図



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**Title of the Invention**

Method for producing a plastic film having a mesh pattern

**Scope of Claim for Patent**

1. A method for producing a plastic film having a mesh pattern, comprising: providing a die for forming a plastic film including an annular outer piece and an inner piece which is provided inside said outer piece with a slight gap therebetween; connecting to an end portion of said inner piece a guide member for guiding a flow of a molten plastic resin; providing at least a pair of revolving members adapted to revolve about said guide member in opposite directions, each of said revolving members having a projection on an inner wall surface thereof; and scratching an outer surface of an extruded plastic resin by said projections to form grooves therein or applying a jet of a molten plastic resin, which is separate from said extruded plastic resin, from said projections to the outer surface of the extruded plastic resin, to thereby form a mesh pattern on the outer surface of the extruded plastic resin.

**Detailed Description of the Invention**

The present invention relates to a method for producing a plastic film having a mesh pattern.

Conventionally, as a method for producing a plastic film having a mesh pattern, there has been known a method in which a die comprising outer and inner pieces is rotated.

However, in the above-mentioned conventional method, a molten plastic resin flowing in the die is extruded while rotating, so that the resistance of the plastic resin becomes high and, therefore, the plastic resin does not flow smoothly and it is difficult to obtain elaborate products. In addition, with respect to a manufacturing apparatus used in the method, it is necessary to provide various grooves and branched portions in an inner surface of the die, so that the apparatus becomes complicated, which causes trouble in the apparatus and a sharp rise in product prices.

In view of the above situation, the present invention has been made. According to the present invention, there is provided a method for producing a plastic film having a mesh pattern, in which while maintaining a die in a stationary state, a mesh pattern can be stably formed. Further, an apparatus used in the method of the present invention has a simple construction, so that trouble in the apparatus is unlikely to occur. Further, elaborate products can be smoothly obtained at a low cost. The method of the present invention for producing a plastic film having a mesh pattern essentially comprises: providing a die for forming a plastic film including an annular outer piece and an inner piece which is provided inside the outer piece with a slight gap therebetween; connecting to an end portion of the inner piece a guide member for guiding a flow of a molten plastic resin; providing at least a pair of revolving members adapted to revolve about the guide member in opposite directions, each of the revolving members having a projection on an

inner wall surface thereof; and scratching an outer surface of an extruded plastic resin by the projections to form grooves therein or applying a jet of a molten plastic resin, which is separate from the extruded plastic resin, from the projections to the outer surface of the extruded plastic resin, to thereby form a mesh pattern on the outer surface of the extruded plastic resin.

Next, one embodiment of the present invention is described, with reference to the drawings.

In the drawings, reference numeral 1 denotes an apparatus for forming a plastic film having a mesh pattern, which is used in the method of the present invention. The apparatus 1 has a die 3 supported on a die holder 2. The die 3 comprises an annular outer piece 4 and an inner piece 6 which is disposed inside the outer piece 6 with a gap 5 for allowing a flow of a molten plastic resin.

A guide member 7 for guiding the flow of molten plastic resin is connected to an end portion of the inner piece 6. The guide member 7 has a diameter which is substantially the same as the diameter of the inner piece 6.

A pair of revolving members 8, 8a are provided in the vicinity of the guide member 7 and are adapted to revolve about the guide member 7 in opposite directions. The revolving members 8, 8a are adapted to be revolved by an external force source.

Each of revolving members 8, 8a has at least one projection 9 formed on its inner wall surface facing the guide member 7. With respect to the shape of the

projection 9, it is appropriately selected, depending on the purpose.

Each of the revolving members 8, 8a may be designed such that a molten plastic resin, which is prepared separately from the molten plastic resin flowing through the die 2, flows therethrough and be jetted from a forward end of the projection 9.

Incidentally, in the drawings, reference numeral 10 denotes a through-hole for inflation. Reference numeral 11 denotes a stabilizing member for stabilizing the molten plastic resin in the form of a tube.

The apparatus arranged as mentioned above is operated as follows. A molten plastic resin flows through the gap 5 between the outer and inner pieces 4, 6 and is extruded. The extruded plastic resin continues to flow along the guide member 7. The projection 9 of each of the revolving members 8, 8a comes into contact with an outer annular surface of the molten plastic resin while the revolving members 8, 8a are revolved about the guide member 7. Thereby, grooves are formed in the surface of the molten plastic resin. In this instance, the molten plastic resin flows lineally along the guide member 7 and the revolving members 8, 8a revolve in opposite directions, so that the grooves are formed in the surface of the molten plastic resin while crossing each other, to thereby form a mesh pattern on the surface of the molten plastic resin.

In another embodiment in which the molten plastic resin separate from the molten plastic resin flowing through the die 2 is jetted from the projection 9 of each of the revolving members 8, 8a, it is unnecessary to bring

the projection 9 into contact with the molten plastic resin flowing along the guide member 7. A mesh pattern can be integrally applied to the molten plastic resin flowing along the guide member 7 by a jet force.

The apparatus for producing a plastic film having a mesh pattern which is used in the present invention is arranged and operated as mentioned above. In the present invention, the die in the apparatus is not rotated and a mesh pattern is applied by the revolving members after extrusion. Therefore, elaborate products can be obtained smoothly.

Further, it is unnecessary to provide various elements in the die, so that the apparatus has a simple construction and trouble in the apparatus is unlikely to occur. Because conventional equipment can be utilized in the method of the present invention, a product can be supplied at a low price.

The plastic sheet having a mesh pattern obtained by the method of the present invention has high resistance to longitudinal tearing, which is likely to occur due to the molecular orientation in conventional plastic films. In addition, the plastic sheet having a mesh pattern has a uniformly small thickness and a satisfactory strength, and is unlikely to slip when stacked. When the plastic sheet having a mesh pattern obtained by the method of the present invention is formed into a bag such that the surface having a mesh pattern is inside of the bag, an adherent contact between opposed inner faces does not occur, so that openability of the bag is satisfactory.

Thus, the present invention has excellent advantages.

It is very useful to practice the method of the present invention.

Brief Description of the Drawings

The accompanying drawings show one embodiment of the present invention. Fig. 1 is a cross-sectional view of an apparatus for producing a plastic film having a mesh pattern, which is used in the method of the present invention. Fig. 2 is a perspective view of a revolving member used in the apparatus of Fig. 1. Fig. 3 is a plan view of a part of a plastic film having a mesh pattern produced by the apparatus of Fig. 1.

1 ... apparatus, 2 ... die holder, 3 ... die,  
4 ... outer piece, 5 ... gap, 6 ... inner piece,  
7 ... guide member, 8, 8a ... revolving member,  
9 ... projections, 10 ... through-hole,  
12 ... stabilizing member.

BEST AVAIL